

DOCKET NO.: 243433US2SX



JPW

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:

Koji YAMAKAWA, et al.

SERIAL NO: 10/673,247

GROUP: 1765

FILED: September 30, 2003

EXAMINER: Binh X. TRAN

FOR: SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE  
SAME

**LETTER**

Mail Stop DD  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Submitted herewith are an International Preliminary Report on Patentability and a Written Opinion for the Examiner's consideration. The reference(s) cited therein have been previously filed on April 11, 2005.

Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

Marvin J. Spivak

Registration No. 24,913

Raymond F. Cardillo, Jr.

Registration No. 40,440

Eckhard H. Kuesters

Registration No. 28,870

Customer Number

**22850**

Tel. (703) 413-3000  
Fax. (703) 413-2220  
(OSMMN 03/06)

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION CONCERNING  
TRANSMITTAL OF COPY OF INTERNATIONAL  
PRELIMINARY REPORT ON PATENTABILITY  
(CHAPTER I OF THE PATENT COOPERATION  
TREATY)  
(PCT Rule 44bis.1(c))

To:

SUZUYE, Takehiko  
c/o Suzuye & Suzuye  
7-2, Kasumigaseki 3-chome  
Chiyoda-ku, Tokyo 100-0013  
JAPON

**RECEIVED**  
2 APR 14 2006 F  
SUZUYE & SUZUYE

Date of mailing (day/month/year)  
06 April 2006 (06.04.2006)

Applicant's or agent's file reference  
03S0639P

**IMPORTANT NOTICE**

International application No.  
PCT/JP2004/014287

International filing date (day/month/year)  
22 September 2004 (22.09.2004)

Priority date (day/month/year)  
26 September 2003 (26.09.2003)

Applicant

KABUSHIKI KAISHA TOSHIBA et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Masashi Honda

Facsimile No. +41 22 740 14 35

Facsimile No. +41 22 338 70 10

## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 03S0639P	FOR FURTHER ACTION		See item 4 below
International application No. PCT/JP2004/014287	International filing date (day/month/year) 22 September 2004 (22.09.2004)	Priority date (day/month/year) 26 September 2003 (26.09.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant KABUSHIKI KAISHA TOSHIBA			

- This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
- This REPORT consists of a total of 6 sheets, including this cover sheet.  
  
In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.
- This report contains indications relating to the following items:
 

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input checked="" type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input checked="" type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application
- The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 740 14 35	Date of issuance of this report 27 March 2008 (27.03.2008)
	Authorized officer  Masashi Honda  Telephone No. +41 22 338 70 10

## PATENT COOPERATION TREATY

REC'D 1 MAR 2005

WIPO

PCT

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)Applicant's or agent's file reference  
see form PCT/ISA/220FOR FURTHER ACTION  
See paragraph 2 belowInternational application No.  
PCT/JP2004/014287International filing date (day/month/year)  
22.09.2004Priority date (day/month/year)  
26.09.2003International Patent Classification (IPC) or both national classification and IPC  
H01L21/02, H01L21/316Applicant  
KABUSHIKI KAISHA TOSHIBA

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80293 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

Neumann, A

Telephone No. +49 89 2399-6924



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/JP2004/014287

---

**Box No. I Basis of the opinion**

---

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/JP2004/014287

---

**Box No. II Priority**

---

1. ☐ The following document has not been furnished:☐ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.3. ☒ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

---

**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-10
Inventive step (IS)	Yes: Claims	
	No: Claims	1-10
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations

see separate sheet

---

**Box No. VI Certain documents cited**

---

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and /or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

**PCT/JP2004/014287****Re Item V****Reasoned statement with regard to novelty, inventive step, or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

- D1: US 2003/071294 A1 (SUN SHAN ET AL) 17 April 2003 (2003-04-17)
- D2: US-B1-6 423 592 (SUN SHAN) 23 July 2002 (2002-07-23)
- D3: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 22, 9 March 2001 (2001-03-09) -& JP 2001 144266 A (HITACHI LTD), 25 May 2001 (2001-05-25) -& US-B1-6 756 262 (NAKAMURA YOSHITAKA ET AL) 29 June 2004 (2004-06-29)
- D4: US-B1-6 610 549 (AGGARWAL SANJEEV ET AL) 26 August 2003 (2003-08-26)
- D5: EP-A-1 039 525 (HITACHI, LTD) 27 September 2000 (2000-09-27)
- D6: WO 03/021656 A (INFINEON TECHNOLOGIES AG; BRUCHHAUS, RAINER) 13 March 2003 (2003-03-13)
- D7: US 2002/004249 A1 (KAWAKUBO TAKASHI) 10 January 2002 (2002-01-10)
- D8: US-A-5 889 299 (ABE ET AL) 30 March 1999 (1999-03-30)
- D9: US 2002/154532 A1 (MIYAZAWA HIROMU ET AL) 24 October 2002 (2002-10-24)
- D10: US 2003/058700 A1 (BRUCHHAUS RAINER ET AL) 27 March 2003 (2003-03-27)
- D11: US-A-5 650 362 (NASHIMOTO ET AL) 22 July 1997 (1997-07-22)
- D12: US 2003/128570 A1 (TANAKA MASAHIRO ET AL) 10 July 2003 (2003-07-10)

It is pointed out that for the documents labelled D3, the late-published document US-B1-6 756 262 is considered to be a translation of its priority document JP 2001 144266 (which was published before the priority date of the present application).

2. The application does not meet the requirements of Articles 33(1) and 33(2) PCT (novelty).
- 2.1 D1 (cf. figs. 1-4 and paragraphs [0019]-[0054]) discloses a method of forming a

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

**PCT/JP2004/014287**

ferroelectric capacitor comprising a PZT dielectric layer (14) by using a hardmask comprising an SRO layer (18) over the top electrode (16) during the step of etching said PZT dielectric layer (14). Said SRO hardmask (18) remains in place after the etching step and therefore forms part of the top electrode when the resulting device is used.

D1 also discloses the corresponding device obtained by the above method as well the subject-matter of all dependent claims.

The subject-matter of claims 1-10 is therefore not new over D1.

- 2.2 For the sake of completeness, it is pointed out that the subject-matter of independent claims 1 and 7 is also not new over D2 and D3 (cf. the passages cited in the search report).
3. The application does not meet the requirements of Article 6 PCT (clarity).
  - 3.1 In claim 1, it is not clear what a "complex oxide" is supposed to be.
  - 3.2 Claim 7 attempts to define a product in terms of the production process. It is, however, impossible for the skilled person to tell from the finished device whether an electrode has been used as mask during the manufacturing process. Therefore the requirements of Article 6 PCT are not met.
  - 3.3 The vague and imprecise statement in the description in line 26 on page 27 to line 9 on page 28 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.